

Amendment and Response
Serial No. 10/040,241
Page 6

Amendments To The Claims

1. (Currently amended) An ~~IR-sensitive~~ infrared-sensitive composition comprising:

(A) 20% to 80% by weight, based on the infrared-sensitive composition, of a polymeric binder consisting of a polymer or mixture of polymers having a weight-average molecular weight in the range of 10,000 to 1,000,000 g/mol, with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less; and

(B) a free radical polymerizable system consisting of:

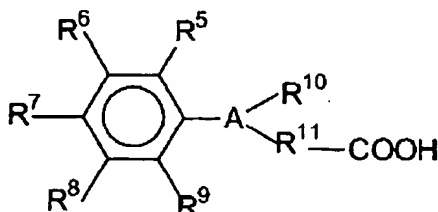
(1) 25% to 75% by weight, based on the infrared-sensitive composition, of at least one polymerizable component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and

(2) an initiator system comprising having:

(a) 0.05% to 20% by weight, based on the infrared-sensitive composition, of at least one compound capable of absorbing IR infrared radiation;

(b) 2% to 15% by weight, based on the infrared-sensitive composition, of at least one compound capable of producing radicals; and

(c) 1% to 10% by weight, based on the infrared-sensitive composition, of at least one carboxylic acid represented by the formula:



wherein each of R⁵, R⁶, R⁷, R⁸ and R⁹ is independently selected from the group consisting of: hydrogen, alkyl, aryl, halogen, alkoxy, hydroxyalkyl, carboxyalkyl,

Amendment and Response
Serial No. 10/040,241
Page 7

alkylthio, alkylsulfonyl, sulfonic, alkylsulfonate, dialkylamino, acyl, alkoxycarbonyl, cyano and nitro; wherein R^5 and R^6 , R^6 and R^7 , R^7 and R^8 , or R^8 and R^9 together optionally form an aromatic or aliphatic ring;

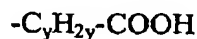
wherein R^{10} is selected from the group consisting of: hydrogen, alkyl, aryl, hydroxyalkyl, carboxyalkyl, acyl, alkoxycarbonyl, alkylsulfonyl and alkylsulfonate; or R^{10} and its bond together optionally form an electron pair; ~~or R^9 and R^{11} together optionally form a ring;~~

wherein R^{11} is an alkylene group of C_1 - C_6 carbon atoms; and wherein R^{10} and R^{11} together optionally form an aliphatic ring; or R^9 and R^{11} together optionally form a ring;
and

wherein A is a heteroatom selected from the group consisting of: N, O and S;
~~with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less~~

wherein the composition, in an uncured form, is dispersible in a suitable aqueous developer.

2. (Original) The composition of claim 1, wherein said carboxyalkyl groups are represented by the formula:



wherein y is an integer from 1 to 6.

3. (Currently amended) The composition of claim 1, wherein said compound capable of absorbing ~~IR~~ infrared radiation is selected from the group consisting of: a dye, a pigment and a combination thereof.

4. (Original) The composition of claim 1, wherein said compound capable of producing radicals is selected from the group consisting of: an azinium compound, a polyhaloalkyl-substituted compound and a combination thereof.

5. (Original) The composition of claim 1, wherein the total acid number of said polymeric binder is 50 mg KOH/g or less.

Amendment and Response
Serial No. 10/040,241
Page 8

6. (Currently amended) The composition of claim 5 1, wherein the total acid number of said polymeric binder is 30 mg KOH/g or less.
7. (Currently amended) The composition of claim 6 1, wherein the total acid number of said polymeric binder is 10 mg KOH/g or less.
8. (Currently amended) The composition of claim 7 1, wherein the total acid number of said polymeric binder is 0 mg KOH/g.

9. (Cancelled)

10. (Currently amended) The composition of claim 1, wherein ~~said free radical polymerizable system is~~ from about 35 wt% to about 65 wt% of the total weight of the infrared-sensitive composition is the free radical polymerizable system.

11. (Currently amended) The composition of claim 1, wherein ~~said initiator system is~~ from about 3.5 wt% to about 45 wt% of the total weight of the infrared-sensitive composition is the initiator system.

12. (Currently amended) The composition of claim 1, wherein said polymer of the polymeric binder is selected from the group consisting of: a polymer derived from an acrylic ester, a cellulose polymer, and a combination thereof.

13. (Currently amended) A printing plate precursor, comprising:

a substrate; and

coated on said substrate, an ~~IR~~ infrared-sensitive composition comprising:

(A) 20% to 80% by weight, based on the infrared-sensitive composition, of a polymeric binder consisting of a polymer or mixture of polymers having a weight-average molecular weight in the range of 10,000 to 1,000,000 g/mol, with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less; and

(B) a free radical polymerizable system consisting of:

(1) 25% to 75% by weight, based on the infrared-sensitive composition, of

Amendment and Response
 Serial No. 10/040,241
 Page 9

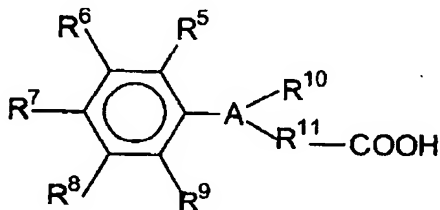
at least one polymerizable component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and

(2) an initiator system ~~comprising~~ having:

(a) 0.05% to 20% by weight, based on the infrared-sensitive composition, of at least one compound capable of absorbing IR, infrared radiation;

(b) 2% to 15% by weight, based on the infrared-sensitive composition, of at least one compound capable of producing radicals; and

(c) 1% to 10% by weight, based on the infrared-sensitive composition, of at least one carboxylic acid represented by the formula:



wherein each of R^5 , R^6 , R^7 , R^8 and R^9 is independently selected from the group consisting of: hydrogen, alkyl, aryl, halogen, alkoxy, hydroxyalkyl, carboxyalkyl, alkylthio, alkylsulfonyl, sulfonic, alkylsulfonate, dialkylamino, acyl, alkoxycarbonyl, cyano and nitro; wherein R^5 and R^6 , R^6 and R^7 , R^7 and R^8 , or R^8 and R^9 together optionally form an aromatic or aliphatic ring;

wherein R^{10} is selected from the group consisting of: hydrogen, alkyl, aryl, hydroxyalkyl, carboxyalkyl, acyl, alkoxycarbonyl, alkylsulfonyl and alkylsulfonate; or R^{10} and its bond together optionally form an electron pair; ~~or R^9 and R^{11} together optionally form a ring;~~

wherein R^{11} is an alkylene group of C_1 - C_6 carbon atoms; and wherein R^{10} and R^{11} together optionally form an aliphatic ring; or R^9 and R^{11} together optionally form a ring;

Amendment and Response
Serial No. 10/040,241
Page 10

and

wherein A is a heteroatom selected from the group consisting of: N, O and S;
~~with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less~~

wherein the precursor is imageable by exposure to infrared radiation, and subsequently processable with a suitable aqueous developer to yield a printing plate.

-
14. (Original) The printing plate precursor of claim 13, further comprising: an oxygen-impermeable overcoat.
15. (Cancelled)
16. (Cancelled)
17. (Cancelled)
18. (Cancelled)
19. (Cancelled)
20. (Cancelled)
21. (Cancelled)

22. (Currently amended) An ~~IR~~ infrared-sensitive composition comprising:

(A) 20% to 80% by weight, based on the infrared-sensitive composition, of a polymeric binder consisting of a polymer or mixture of polymers having a weight-average molecular weight in the range of 10,000 to 1,000,000 g/mol, with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less; and

(B) a free radical polymerizable system consisting of:

(1) 25% to 75% by weight, based on the infrared-sensitive composition, of at least one polymerizable component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical

Amendment and Response
Serial No. 10/040,241
Page 11

polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and

(2) an initiator system comprising having:

(a) 0.05% to 20% by weight, based on the infrared-sensitive composition, of at least one compound capable of absorbing IR infrared radiation;

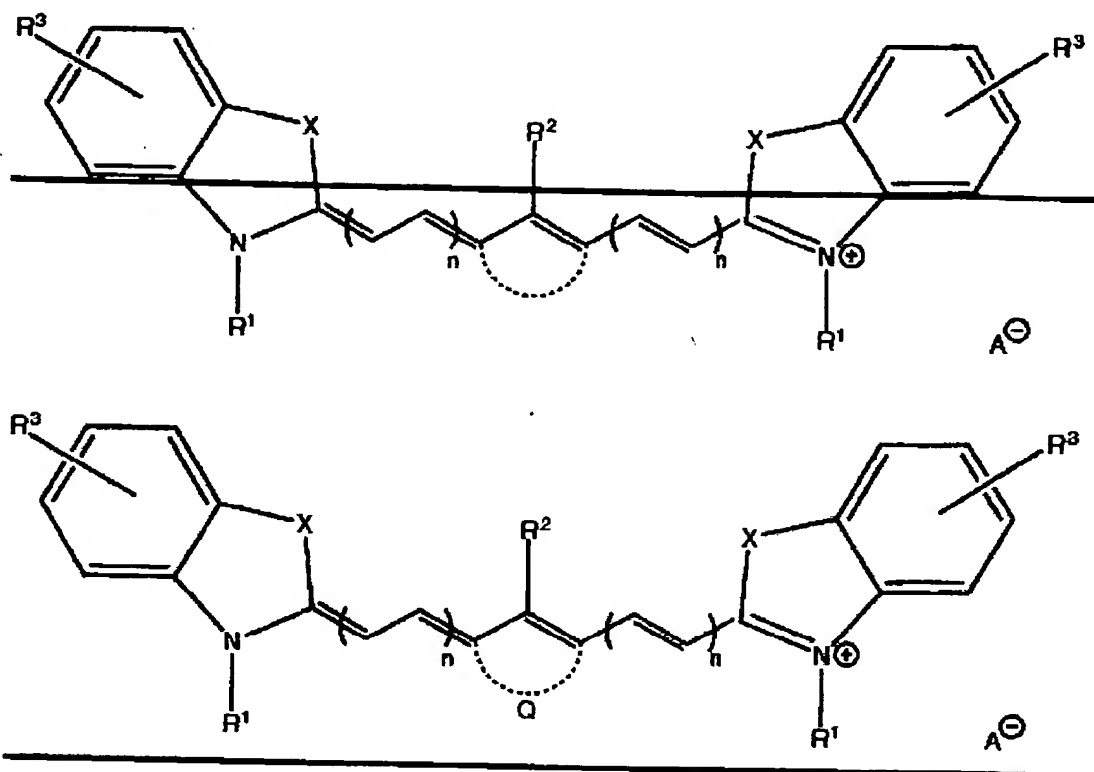
(b) 2% to 15% by weight, based on the infrared-sensitive composition, of at least one compound capable of producing radicals; and

(c) 1% to 10% by weight, based on the infrared-sensitive composition, of at least one polycarboxylic acid having an aromatic moiety substituted with a heteroatom selected from N, O and S and further having at least two carboxyl groups wherein at least one of said carboxyl groups is bonded to said heteroatom via a methylene group; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less.

23. (Original) The composition of claim 22, wherein said compound capable of absorbing IR infrared radiation is selected from the group consisting of: triarylamine dyes, thiazolium dyes, indolium dyes, oxazolium dyes, cyanine dyes, polyaniline dyes, polypyrrole dyes, polythiophene dyes, leuco dyes, phthalocyanine pigments and dyes and a combination thereof.

Amendment and Response
Serial No. 10/040,241
Page 12

24. (Currently amended) The composition of claim-~~23~~ 22, wherein said compound capable of absorbing ~~IR~~ infrared-radiation is a cyanine dye represented by the formula-(A):



wherein each X is independently selected from the group consisting of: S, O, NR and C(alkyl)₂;

each R^1 is independently selected from the group consisting of: an alkyl, an alkylsulfonate and an alkylammonium group;

R^2 is selected from the group consisting of: hydrogen, halogen, SR, SO₂R, OR and NR₂;

each R^3 is independently selected from the group consisting of: a hydrogen, an alkyl group, COOR, OR, SR, SO₃⁻, NR₂, a halogen, and an optionally substituted benzofused ring;

A^- represents an anion;

[[- -]] - Q - represents an optional bridge completing a five- or six-membered carbocyclic ring;

Amendment and Response
Serial No. 10/040,241
Page 13

wherein each R is independently selected from the group consisting of: hydrogen, an alkyl and an aryl group; and

wherein each n is an integer independently selected from the group consisting of: 0, 1, 2 and 3.

25. (Currently amended) The composition of claim-~~24~~ 22, wherein said compound capable of absorbing ~~IR~~ infrared radiation is selected from the group consisting of:

2-[2-[2-phenylsulfonyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumchloride;

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumchloride;

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclopenten-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumtosylate;

2-[2-[2-chloro-3-[2-ethyl-(3H-benzthiazole-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-3-ethyl-benzthiazolium-tosylate;

2-[2-[2-chloro-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium tosylate; and

a combination thereof.

26. (Original) The composition of claim 22, wherein said compound capable of producing radicals is selected from the group consisting of: polyhaloalkyl-substituted compounds, azinium compounds and a combination thereof.

27. (Currently amended) The composition of claim-~~26~~ 22, wherein said compound capable of producing radicals is selected from the group consisting of:

N-methoxy-4-phenyl-pyridinium tetrafluoroborate;

tribromomethylphenylsulfone;

1,2,3,4-tetrabromo-n-butane;

2-(4-methoxyphenyl)-4,6-bis(trichloromethyl)-s-triazine;

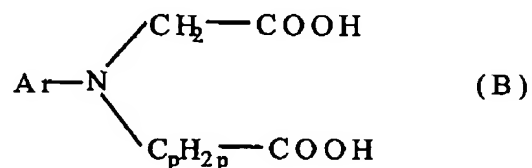
2-(4-chlorophenyl)-4,6-bis(trichloromethyl)-s-triazine;

Amendment and Response
 Serial No. 10/040,241
 Page 14

2-phenyl-4,6-bis(trichloromethyl)-s-triazine;
 2,4,6-tri-(trichloromethyl)-s-triazine;
 2,4,6-tri-(tribromomethyl)-s-triazine;
 2-hydroxytetradecyloxyphenyl phenyliodonium hexafluoroantimonate;
 2-methoxy-4-phenylaminobenzenediazonium hexafluorophosphate and
 a combination thereof.

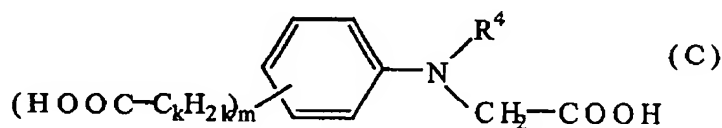
28. (Original) The composition of claim 22, wherein said polycarboxylic acid is selected from the group consisting of:

a compound represented by the formula (B):



wherein Ar is selected from the group consisting of: an unsubstituted aryl, a mono-substituted aryl and poly-substituted aryl group; and p is an integer from 1 to 5;

a compound represented by the formula (C):



wherein R⁴ is selected from the group consisting of: hydrogen and a C₁-C₆ alkyl group; and wherein each of k and m is independently an integer from 1 to 5; and

a combination of compounds represented by formula (B) and (C).

Amendment and Response
Serial No. 10/040,241
Page 15

29. (Currently amended) The composition of claim ~~26~~ 22, wherein said polycarboxylic acid is N-phenyliminodiacetic acid.

30. (Original) The composition of claim 22, further comprising one or more contrast-enhancing dyes ~~for increasing the contrast of the image.~~

31. (Original) The composition of claim 22, wherein the total acid number of said polymeric binder is 50 mg KOH/g or less.

32. (Currently amended) The composition of claim ~~34~~ 22, wherein the total acid number of said polymeric binder is 30 mg KOH/g or less.

33. (Currently amended) The composition of claim ~~32~~ 22, wherein the total acid number of said polymeric binder is 10 mg KOH/g or less.

34. (Currently amended) The composition of claim ~~33~~ 22, wherein the total acid number of said polymeric binder is 0 mg KOH/g.

35. (Cancelled)

36. (Currently amended) The composition of claim 22, wherein ~~said free radical polymerizable system is from about 35 wt% to about 65 wt% of the total weight of the~~ infrared-sensitive composition is the free radical polymerizable system.

37. (Currently amended) The composition of claim 22, wherein ~~said initiator system is from about 3.5 wt% to about 45 wt% of the total weight of the~~ infrared-sensitive composition is the initiator system.

38. (Currently amended) A printing plate precursor, comprising:
a substrate; and
coated on said substrate, an ~~IR~~ infrared-sensitive composition comprising:
(A) 20% to 80% by weight, based on the infrared-sensitive composition, of a polymeric binder consisting of a polymer or mixture of polymers having a weight-

Amendment and Response
Serial No. 10/040,241
Page 16

average molecular weight in the range of 10,000 to 1,000,000 g/mol, with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less; and

(B) a free radical polymerizable system consisting of:

(1) 25% to 75% by weight, based on the infrared-sensitive composition, of at least one polymerizable component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and

(2) an initiator system comprising having:

(a) 0.05% to 20% by weight, based on the infrared-sensitive composition, of at least one compound capable of absorbing IR infrared radiation;

(b) 2% to 15% by weight, based on the infrared-sensitive composition, of at least one compound capable of producing radicals; and

(c) 1% to 10% by weight, based on the infrared-sensitive composition, of at least one polycarboxylic acid having an aromatic moiety substituted with a heteroatom selected from N, O and S and further having at least two carboxyl groups wherein at least one of said carboxyl groups is bonded to said heteroatom via a methylene group; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less.

39. (Original) The printing plate precursor of claim 38, further comprising: an oxygen-impermeable overcoat.

40. (Cancelled)

41. (Cancelled)

42. (Cancelled)

Amendment and Response
Serial No. 10/040,241
Page 17

43. (Cancelled)

44. (Cancelled)

45. (Cancelled)

46. (New) The composition of claim 1, wherein said polymer of the polymeric binder is poly(methyl methacrylate).

47. (New) The composition of claim 1, wherein said mixture of polymers of the polymeric binder includes poly(methyl methacrylate).

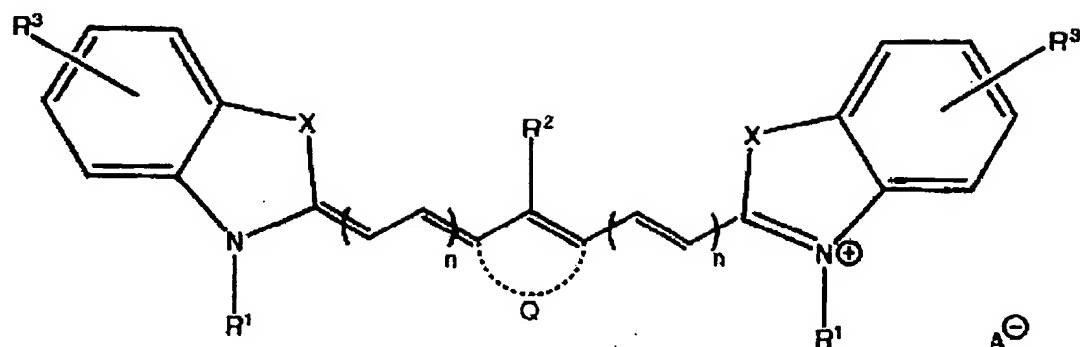
48. (New) The composition of claim 1, wherein the polymerizable component of the free radical polymerizable system includes a monomer, oligomer, or prepolymer derived from acrylic or methacrylic acid.

49. (New) The composition of claim 1, wherein the polymerizable component of the free radical polymerizable system includes an oligomer or prepolymer selected from the group consisting of: urethane acrylates and methacrylates; epoxide acrylates and methacrylates; polyester acrylates and methacrylates; polyether acrylates and methacrylates; and unsaturated polyester resins.

50. (New) The composition of claim 1, wherein said compound capable of absorbing infrared radiation is selected from the group consisting of: triarylamine dyes, thiazolium dyes, indolium dyes, oxazolium dyes, cyanine dyes, polyaniline dyes, polypyrrole dyes, polythiophene dyes, leuco dyes, phthalocyanine pigments and dyes and a combination thereof.

51. (New) The composition of claim 1, wherein said compound capable of absorbing infrared-radiation is a cyanine dye represented by the formula:

Amendment and Response
Serial No. 10/040,241
Page 18



wherein each X is independently selected from the group consisting of: S, O, NR and C(alkyl)₂;

each R¹ is independently selected from the group consisting of: an alkyl, an alkylsulfonate and an alkylammonium group;

R² is selected from the group consisting of: hydrogen, halogen, SR, SO₂R, OR and NR₂;

each R³ is independently selected from the group consisting of: a hydrogen, an alkyl group, COOR, OR, SR, SO₃⁻, NR₂, a halogen, and an optionally substituted benzofused ring;

A⁻ represents an anion;

-- Q -- represents an optional five- or six-membered carbocyclic ring;

wherein each R is independently selected from the group consisting of: hydrogen, an alkyl and an aryl group; and

wherein each n is an integer independently selected from the group consisting of: 0, 1, 2 and 3.

52. (New) The composition of claim 1, wherein said compound capable of absorbing infrared radiation is selected from the group consisting of:

2-[2-[2-phenylsulfonyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumchloride;

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumchloride;

Amendment and Response
Serial No. 10/040,241
Page 19

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclopenten-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumtosylate;
2-[2-[2-chloro-3-[2-ethyl-(3H-benzthiazole-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-3-ethyl-benzthiazolium-tosylate;
2-[2-[2-chloro-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium tosylate; and
a combination thereof.

53. (New) The composition of claim 1, wherein said compound capable of producing radicals is selected from the group consisting of:

N-methoxy-4-phenyl-pyridinium tetrafluoroborate;
tribromomethylphenylsulfone;
1,2,3,4-tetrabromo-n-butane;
2-(4-methoxyphenyl)-4,6-bis(trichloromethyl)-s-triazine;
2-(4-chlorophenyl)-4,6-bis(trichloromethyl)-s-triazine;
2-phenyl-4,6-bis(trichloromethyl)-s-triazine;
2,4,6-tri-(trichloromethyl)-s-triazine;
2,4,6-tri-(tribromomethyl)-s-triazine;
2-hydroxytetradecyloxyphenyl phenyliodonium hexafluoroantimonate;
2-methoxy-4-phenylaminobenzenediazonium hexafluorophosphate and
a combination thereof.

54. (New) The composition of claim 1, wherein the carboxylic acid is an N-aryl- α -amino carboxylic acid.

55. (New) The composition of claim 1, further comprising one or more contrast-enhancing dyes.

56. (New) The composition of claim 22, wherein said polymer of the polymeric binder is selected from the group consisting of: a polymer derived from an acrylic ester, a cellulose polymer, and a combination thereof.

Amendment and Response
Serial No. 10/040,241
Page 20

57. (New) The composition of claim 22, wherein said polymer of the polymeric binder is poly(methyl methacrylate).
58. (New) The composition of claim 22, wherein said mixture of polymers of the polymeric binder includes poly(methyl methacrylate).
59. (New) The composition of claim 22, wherein the polymerizable component of the free radical polymerizable system includes a monomer, oligomer, or prepolymer derived from acrylic or methacrylic acid.
60. (New) The composition of claim 22, wherein the polymerizable component of the free radical polymerizable system includes an oligomer or prepolymer selected from the group consisting of: urethane acrylates and methacrylates; epoxide acrylates and methacrylates; polyester acrylates and methacrylates; polyether acrylates and methacrylates; and unsaturated polyester resins.
-